

ACTIVITY Australia's arid ecosystems

SKILLS

- > Processing and analysing data and information
- > Form and function
- > Systems

Australia is the driest continent on Earth, excluding Antarctica, with about 70% of its area classified as arid or semi-arid, with less than 50 mm of rain a year. The Australian continent has many types of ecosystems, especially desert ecosystems. Desert landscapes are not all the same and vary from stony desert covered with small pebbles, to dry grasslands, to hills and gorges, to sand dunes, dry lake beds and claypans. The animals that live in these deserts have worked out ways to survive in areas of very little rainfall by using specially suited behaviours for the harsh environment. The temperature can be very hot during the day and freezing at night, due to very little water and tree cover, which serve to moderate the climate.

The Australian continent has had no new rock added by volcanism for millions of years and the mountain ranges have been steadily eroding all this time. This means that the soils have been weathered and leached more than any others, making them very nutrient-deficient. Not much leaf litter forms under these conditions. Herbivores can quickly eat through the patchy vegetation in these zones, and so the numbers of animals varies with the seasons and climate.

The Australian ecosystems have changed over thousands of years from forest ecosystems to more open and drier ecosystems, such as grasslands and scrub. This has led to the decline or extinction of forest animals, such as ringtail possums, and the increase of grazing animals, such as kangaroos. Mammals, such as rodents and bats, are common and usually nocturnal, going out at night to avoid the daytime heat. Kangaroos tend to rest in the shade during the daytime and wombats stay underground for the same reason. Some animals, like camels, were introduced into Australia only in the last 200 years but they have come to flourish in the desert regions because of their ready-made adaptations.

Plants in desert regions are generally woody, smaller and spaced further apart. Their features include small, light-coloured (to reflect heat), leathery leaves (to conserve water), sometimes covered with reflective hairs, scales or resins. Some plants have seeds that grow only after heavy rains to give them a better chance of success.

Indigenous Australians have inhabited this continent for longer than 60 000 years. These people came to use the land in a sustainable way. They tended to eat only a certain amount of the edible berries and leaves on the plants they came across, making sure to leave some untouched. They also developed a form of agriculture called firestick agriculture. Fire was used to hunt by setting fire to grass to chase out animals. They also regularly burnt certain fields to help new grass to grow, which would feed the animals they hunted. They possibly helped the spread of dry eucalypt forests after their arrival, since these trees are fire-tolerant.

1 Determine if each of the following statements is true or false.

- a Australia is one of the driest continents. _____
- b All Australian plants have adapted to deal with low water levels. _____

CHAPTER 3

LIVING IN HARMONY

- c Animals have physical adaptations but no behavioural adaptations. _____
- d Kangaroos run mostly during the day and rest at night. _____
- e Most Australian plants need fire to produce seeds. _____

2 Why do Australian desert soils tend to be poor?

3 Complete the following table in relation to the environmental characteristics of hot/dry deserts.

Environmental characteristic	Brief description
Rainfall	
Temperature	
Soil type	
Plant types (general)	
Animal types (general)	

4 What is the main reason why the Australian desert can be so hot in the day but extremely cold at night?

5 Classify the following as behavioural adaptations or structural adaptations, and then give an example of a living thing with the adaptation.

- a Sleeping during the hot day and being active at night.

- b Limbs with claws to dig into the ground.

- 6 Explain why most Australian desert mammals are nocturnal.

- 7 The erosion of mountains has left little organic matter in the soils. What effect has this had on Australian plants and animals?

- 8 Are camels native to Australia or have they been introduced? Why would conservationists be concerned with the large herds that exist in central Australia?

- 9 What are the main problems faced by animals and plants living in Australia's desert ecosystems?

- 10 Explore the many types of adaptations that desert plants (vegetation) have to cope with the problems in arid regions, and compare this with adaptations found in forests. Make a poster to present your findings.